



RESEARCH ARTICLE

STUDY OF VARIOUS LECTURE DELIVERY METHODS IN BIOCHEMISTRY AND ITS EFFECT ON
TEACHING LEARNING PROCESS

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ABSTRACT

Objective: The aim of the study was to assess effect various lecture delivery techniques such as using chalk board, lectures using power point presentation (PPT) and the lectures using transparencies and over head projector (TOHP) on teaching learning process. The first year MBBS students were asked to assess the effect of three biochemistry lectures given by above three different lecture delivery methods by filling in a questionnaire. After each lecture we compared effect of lectures delivered by different methods by objective test.

Observation: One hundred and fifty students were subject of this study. The results of the study showed that students mostly preferred power point teaching. As far as the student's performance is concerned the impact of power point teaching was much more than traditional Chalkboard and lectures using transparency and overhead projector (OHP) which is evaluated by objective test..

Conclusion: We found that power point presentations had made a positive impact on various aspects of their learning in biochemistry than OHP and blackboard method. We conclude that this teaching method is very useful than conventional lecture-based teaching in the biochemistry curriculum.

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INTRODUCTION

Biochemistry is an important area of knowledge in the health course, such as in medicine, nursing, which is taught in the first year of the course with an average number of 80 – 100 hours. According to the specificity of each course, it should comprehend theoretical and practical knowledge related to cellular basis of physiological and chemical processes to human body functioning. These issues are of particular importance in multiple aspects to allow for a deeper understanding of health-diseases processes and diagnosis. System biology, metabolic engineering, and other recent developments in biochemistry suggest that health professionals also require a detailed familiarity with the compounds and metabolic pathways of intermediary metabolism and biochemical control which should be considered one of the reasons why large number of students fail to develop the true potential and lose the enthusiasm and motivation for the subject. (Novelli and Fernandes, 2007) The teaching of biochemistry has specific features, since it involves an overload of ever-changing information and implicates an extensive list of terminology, such as names of enzymes and metabolic pathways. It is evident that these specific contents

understanding needs a high level of abstract thinking from undergraduates, and has lead to search new teaching techniques. (Novelli and Fernandes, 2007) In recent years, undergraduate training in biochemistry has been revolutionized with adoption of new methods of teaching including computer assisted learning, use of audiovisual aids, problem based learning and clinical studies. (Agrawal et al., 2006) Experiments by use of single or multiple tools for teaching medical biochemistry, in addition to conventional teaching have been found to be useful (D'Souza Jyothi et al., 2013). At present, the most common ways of lecture delivery include the lectures using PowerPoint (PPT) presentations, lectures utilizing the transparency and overhead projector (TOHP) besides the traditional 'chalk and talk' method. Assessing and evaluating the quality of teaching and its impact on student learning could be done by using several strategies. Students's feedback is the most common, easier, economical and valid method in obtaining data towards it. Teachers as well as students would benefit by the feedback. This study was undertaken to find out students' opinions on the impact of PowerPoint presentations in lectures compared with TOHP and the traditional chalkboard teaching, and compare their effectiveness on the students' performance.

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MATERIALS AND METHODS

A questionnaire based survey of students of first year MBBS receiving lectures using either chalkboard or transparencies and overhead projector (TOHP) or PowerPoint (PPT) presentations was conducted in a our medical college at Aurangabad in Maharashtra after taking permission from the head of the biochemistry department. A total of 150 students were allocated to three groups (n = 50), in such a way that each group received three lectures by three different methods by three different teachers. An objective test comprising of 10 multiple choice questions was given after each lecture to assess their performance and to compare the impact of lecture delivered by three different methods. The students were asked to fill in the questionnaire about their assessment of the impact of three biochemistry lectures delivered by three different methods of lecture delivery, viz. chalkboard, TOHP and the PPT presentation. For each of the lecture given by a different lecture delivery method, the students were asked to grade each of the following parameter out of a maximum mark of 5:

Table 1. Questionnaire asked to students

S. No.	Question	Score				
		1- Bad	2- Good	3- Better	4- Best	5- Excellant
1	Whether the lecture was well organized?					
2	Whether the lecture was well understood by the student?					
3	Whether the board work &/or visual aids were clear?					
4	Whether the lecture stimulated my interest?					
5	Whether the lectures advanced my understanding?					

Then totaling the above five items, students assessed the overall impact of the lecture out of a maximum mark of 25. Higher the marks, better the assessment. The average of the students' marks in each of the three groups was taken for finding the final assessment score regarding each of the lecture delivery methods. The difference among the assessment scores of lectures using Blackboard, OHP and PowerPoint was statistically analysed using one-way ANOVA.

RESULTS

As per the questionnaire filled by the students, average scores given by the students to lectures using chalkboard were 18.84, using TOHP were 15.04, using PowerPoint were 22.56 out of a maximum score of 25 (Table 2, Figure 1). The difference among the assessment scores of lectures using Blackboard, OHP and PowerPoint was highly statistically significant (P value < 0.001).

Table 2. Scores given by the students (Mean ± SD)

Method of teaching	Score Given by student (Mean ± SD)
PPT	22.56 ± 1.08
Chalkboard	18.84 ± 0.95
TOHP	15.04 ± 0.89

We compared the difference between the lectures, The difference in the scores between lectures with Blackboard and PowerPoint is statistically significant (P value < 0.01). And the difference in scores between lectures using OHP and PowerPoint is highly statistically significant (P value < 0.001). The difference in scores between lectures utilizing Blackboard and OHP is statistically not significant (P value > 0.01). (Table 3, Figure 2

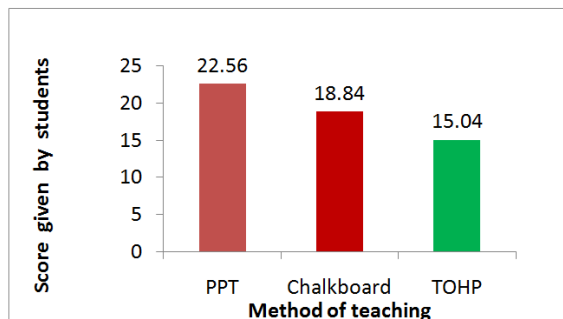


Figure 1. Scores given by the students

Table 3. Difference in the scores between lectures

Methods of Teaching	difference in the scores between lectures	p value
PPT vs Chalk board	3.72	< 0.01 *
PPT vs TOHP	7.52	< 0.001**
Chalk board Vs TOHP	3.8	> 0.01*

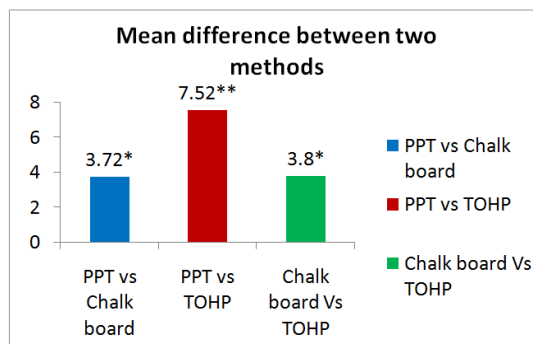


Figure 2. Difference in the scores between lectures

Therefore, students preferred lectures with PPT presentations as it was rated with the highest average score and also it contained the least standard deviation in the scores of students, too. The average marks of students taught using PowerPoint were 8.7, using Blackboard were 7.4, while using OHP were 6.3, out of maximum marks of 10. (Table 4, Figure 3)

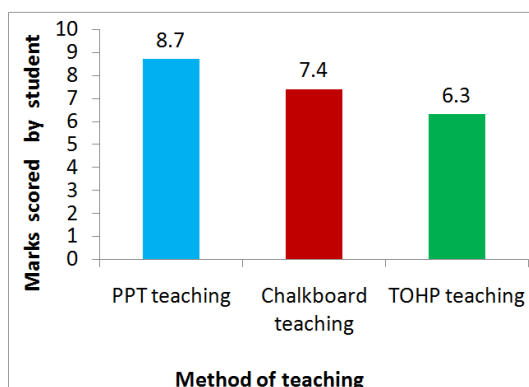


Figure 3. Marks scored by student

Table 4. Marks scored by student

Method of teaching	Average Marks scored by student
PPT teaching	8.7
Chalkboard teaching	7.4
TOHP teaching	6.3

DISCUSSION

Teaching is an art. By making use of best teaching aid, teacher can teach and make the student understand, remember and reproduce well. Thus improving the academic performance of the student. (Priyadarshani *et al.*, 2012) The present study was undertaken to determine whether using PowerPoint (PPT) or other such media are superior forms of delivery for lecturing over the traditional 'chalk and talk' or the use of transparencies and an overhead projector (TOHP). An evaluation by the student can provide the teacher with useful feedback information regarding the best teaching aid and teaching method. (Priyadarshani *et al.*, 2012) Regarding preference of students for a particular teaching aid we found highly statistically significant result and the order of priority of teaching aids as assessed by the students is: PPT > Chalkboard > TOHP, consistent with the findings of previous study by Seth *et al.* (2010). As far as the students' performance is concerned, we found a statistically significant result that the order of performance was: Chalkboard > PPT > TOHP. So our finding that the marks of students taught by ppt were significantly higher than the students taught by TOHP, does not agree with two of the earlier studies which observed no difference in students' performance in tests who were taught by different methods (Shallcross and Harrison, 2007; Szabo and Hastings, 2000). In case of PPT presentations, the main reason for liking was that they avoided the issue of poor handwriting and dirty blackboard. It is more interesting and engaging. A study has pointed out that in Power- Point the ability to integrate the text and the pictures and images is a great advantage and improves the educative value of the subject. The drawback which the students pointed in black board teaching is that, it takes time to draw a labelled diagram on the board and during that time the teachers eye contact with the student is interrupted (D'Souza Jyothi *et al.*, 2013; Vikas Seth *et al.*, 2010). One disadvantage of PPT seems to be that the student becomes a passive observer rather than an active participant (Casanova and Casanova, 1991). It is suggested that although PPT has some positive effects, but it reduces the interactive discussion between teacher and students (Garg *et al.*, 2004). Some have argued that PPT encourages active learning environment, increase effectiveness of lectures and lend clarity to the subject (Ruksana Parvin *et al.*, 2010) and the use of PowerPoint can help teachers to "help their students learn" (Pallavi Vishwekar and Prashant Basapure, 2016). Audiovisual aids should be used to enhance and complement the lectures. Judicious use of different methods increases the understanding, remembrance and reproducibility and thus academic performance of the student. The whole exercise should motivate, enthuse, encourage the students to think and not overload them.

Conclusion

Students preferred PowerPoint teaching as evidenced by the subjective assessment of the students. As far as the objective assessment of students' performance is concerned the impact of traditional Chalkboard teaching and PowerPoint presentation was much more than the lectures using transparency and OHP. Every method will have its advantages and disadvantages, but when used appropriately could find better ratings by the students.

REFERENCES

- Agrawal M; Sankdia, Rajanish Kumar. 2006. Attitude of medical students towards the use of audio visual aids during didactic lectures in pharmacology in a medical college of central India. *International Journal of Basic & Clinical Pharmacology*, dec;5(2), p. 416-422, ISSN 2279-0780.
- Casanova J, Casanova SL. 1991. Computers as electronic blackboard: Remodelling the organic chemistry lecture. *Educom Rev. Spring*, 31- 4.
- D'Souza Jyothi M, Raghvendra U, D'Souza Deepak H. 2013. Teaching Learning of biochemistry in undergraduate medical curriculum: Perceptions and Opinions of Medical Students. *Education in medicine Journal*, 5 (2), e45-e49. ISSN 2180-1932.
- Garg A, Rataboli P. V., Muchandi K. 2004. Student's opinion. On prevailing teaching methods in pharmacology and changes recommended. *Indian J. Pharmacol*, June ;3(36), 155-158.
- Novelli ELB, Fernandes AAH. 2007. Students' preferred teaching techniques for biochemistry in biomedicine and medicine courses. *Biochem Mol Biol Educ.*, 35:263-266.
- Pallavi Vishwekar, Prashant Basapure. 2016. Assessment and comparison of teaching effectiveness of chalk and talk and microsoft powerpoint presentation. *Journal of evaluation of Medical and Dental Sciences*, October;5(85), 6327-6330
- Priyadarshani K. S, H. V. Shetty, Reena R. 2012. Assessment of different teaching aids and teaching methods for the better perception of Biochemistry by 1st MBBS students. *Journal of Evaluation of Medical and Dental Science*, Dec;1 (6), 1159-1165.
- Ruksana Parvin, MD Nazmal Haque, Naser Ahmed. 2010. Is Audio visual method better than traditional for medical students ?- a survey report. *Bangladesh J Medicine*, 21:60-67.
- Shallcross DE, Harrison TG. 2007. Lectures : electronic presentations versus chalk and talk-a chemists view. *Chem Educ Res Pract.*, 8,73-9.
- Szabo, A., Hastings, N. 2000. Using IT in the undergraduate classroom: should we replace the blackboard with PowerPoint?. *Computers & Education*, 35, 175-187.
- Vikas Seth, Perna Upadhyaya, Mushtaq Ahmad, Vijay Moghe. 2010. PowerPoint or Chalk and talk: Perception of medical students versus dental students in a Medical College in India. *Advances in Medical Education and practice*, 1,11-16.
